REMARKS

In the First Office Action, the Examiner noted that claims 13-24 are pending in the application and that claims 13-24 stand rejected. The Examiner further indicates that claims 18 and 19 have been objected to and would be allowable if re-written to include the limitations of the base claim and any intervening claims. By this response, claims 13, 16, 19 and 20 have been amended to more clearly define the invention of the Applicant.

The Applicant gratefully acknowledges the Examiner's indication of allowable subject matter, however, in view of the amendments presented above and the following discussion, the Applicant respectfully submits that none of these claims now pending in the application are anticipated under the provisions of 35 U.S.C. § 102. Thus, the Applicant respectfully submits that all of these claims are now in allowable form.

Rejections

A. 35 U.S.C. § 102

The Examiner rejected the Applicant's claims 13-14, 16-17, 20-21 and 23-24 under 35 U.S.C. § 102(b) as being anticipated by Noda et al. (US Pat. No. 5,617,135, hereinafter "Noda"). The rejection is respectfully traversed.

"Anticipation requires the presence in a single prior art reference disclosure of <u>each and every element of the claimed invention</u>, <u>arranged</u> as in the claim" (<u>Lindemann Maschinenfabrik GmbH v. American Hoist & Derrik Co.</u>, 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1983)). (emphasis added). The Applicant submits that Noda fails to disclose each and every element of the Applicant's claimed invention arranged as in at least the Applicant's amended claim 1.

More specifically, the Examiner alleges: "Considering claims 13 and 20, Noda et al. discloses all claimed subject matter, note;

a) the claimed "wherein varying at least one of said filter coefficients **<u>in dependence on the video level of the current pixel of said signal to be filtered</u>**" and "controlling means connected to said digital filter means for varying at least one of said filter coefficients **<u>in dependence on the video level of the current pixel of said signal to be filtered</u>**", is met by controller 120 (Fig.1) comprising filter control 3 and filter selector 2, which controller controls the adaptive filter 1 that receives digital video signal 103."

The Applicant respectfully disagrees as the underlined features in bold above are neither disclosed nor suggested by Noda et al..

More specifically, Noda discloses: "A controller 120 (is) made up of a filter selector 2 for selecting a filter characteristic according to users' demands at multiple points and a filter control 3 for controlling the characteristic of the selected filter." Col. 4, ll. 30 – 33. Noda, in Fig. 1, indicates that a video signal is applied to an adaptive filter 1; however, Fig. 1 also indicates clearly that said filter 1 is controlled "corresponding to the quality of a video signal to be transmitted from a terminal in a site according to user's demand at each of the other sites, and means for controlling a characteristic of the selected filter taking both the quantity of information in the video signal and the situations of a telecommunication network into consideration," see col. 2, ll. 54 to 60. As such, the Applicant submits that, in Noda, filter coefficients are selected according to a transmission channel, however, Noda neither discloses nor suggests to select filter coefficients **<u>in dependence on the video level of the current pixel of said signal to be filtered</u>** as taught in the Applicant's Specification and claimed by at least the Applicant's amended, independent claims 13 and 20.

More specifically, Claim 1 has been amended to point out more precisely that in the invention of the Applicant, at least one of said filter coefficients of the filter is varied in dependence on the video level for a current pixel by stronger filtering a lower video level for said pixel while less or not filtering a higher video level for said pixel to reduce noise in lower video level.

In contrast to the invention of the Applicant, in Noda, a filter processing operation of an adaptive filter is illustrated on Fig.2, however, "The filter coefficient c(k,l), ... is used for calculation of a coefficient selected and controlled by the filter selector 2 and filter control 3." (See Noda, Col. 6, lines 4 – 7). At Col. 6, lines 35-37, Noda teaches that "The filter selector 2, when receiving the video quality request signal transmitted from each site, starts the filter selection algorithm." As such, the Applicant submits that, in contrast to the invention of the Applicant, in Noda the **coefficients are not selected in dependence on the video level of the current pixel of the signal to be filtered** as taught and claimed by the Applicant. More specifically, the Applicant points out that in Col. 7, lines 13-16, Noda teaches "For example, at the time of starting the multi-point visual communication, the filter selector is designed to previously select the middle-resolution filter with respect to all the sites." Further, in Col. 4, lines 62-66, Noda

teaches "The filter control 3 (shown in Fig. 4) is provided to integrate a video information quantity at an information source coder 4 and a telecommunication network situation at the telecommunication network interface 6 and to a filter coefficient determining the filter characteristic of the adaptive filter part 1." As such, the Applicant submits that **Noda neither discloses nor suggests** selecting filter coefficients in dependence on the video level of the current pixel of said signal to be filtered and never thought about "varying at least one of said filter coefficients of the filter in dependence on the video level for a current pixel by stronger filtering a lower video level for said pixel while less filtering or not filtering a higher video level for said pixel to reduce noise in the lower video level" as taught in the Applicant's Specification and claimed by at least the Applicant's amended, independent claims 13 and 20.

Nowhere in Noda is disclosed or suggested – "varying the filter coefficients accordingly to video level of current pixel." Instead and in contrast to the invention of the Applicant, Noda teaches "selecting filter coefficients (filter characteristic), so that video information quantity is optimized so as not to exceed the ability of the telecommunication network". At most, such teachings of Noda can be interpreted to teach a dependence on the video frequency, but certainly not a dependence on the video level of the current pixel as taught and claimed by the Applicant.

Therefore and for at least the reasons recited above, the Applicant submits that Noda fails to disclose each and every element of the Applicant's claimed invention as claimed in at least the Applicant's independent claims 13 and 20. As such, the Applicant submits that for at least the reasons recited above, the Applicant's independent claims 13 and 20 are not anticipated by the teachings of Noda, and, as such, fully satisfy the requirements of 35 U.S.C. § 102 and are patentable thereunder.

Furthermore, the Applicant's dependent claims 14, 16-17 and 21 and 23-24 depend either directly or indirectly from the Applicant's independent claims 13 and 20, respectively, and recite additional features thereof. As such, the Applicant submits that at least because the Applicant's claims 13 and 20 are not anticipated by the teachings of Noda, the Applicant further submits that the Applicant's dependent claims 14, 16-17 and 21 and 23-24, which depend either directly or indirectly from the Applicant's claims 13 and 20, are also not anticipated by the teachings of Noda, and, as such, fully satisfy the requirements of 35 U.S.C. § 102 and are patentable thereunder.

The Applicant reserves the right to establish the patentability of each of the claims individually in subsequent prosecution.

B. 35 U.S.C. § 102

The Examiner rejected the Applicant's claims 13-15 and 20-22 under 35 U.S.C. § 102(b) as being anticipated by Schweid et al. (US Pat. No. 5,835,630, hereinafter "Schweid"). The rejection is respectfully traversed.

The Examiner cited Schweid, col. 24, lines 37-40), which recites: "This image type or class information is fed into a weighting coefficients and gain factor generator 302 which generates the weighting coefficients and gain factors to be utilized by the non-separable two dimensional filter 304." and col. 22, lines 7-8 and 39-40, which recites: "If (pixel is "high frequency halftone"), then filter is LOWPASS." "It is noted that the enhancement filter amplifies all higher frequencies, and the lowpass filter attenuates the higher frequencies."

The Applicant agrees that a 2-D filter is well known and it is obvious that a lowpass filter attenuates higher frequencies, however, the Applicant disagrees that the "image processing apparatus utilizing the 2-D filter of Fig.1 and weighting coefficients and gain generator factors 302 used by the 2-D filter (col. 24, 37-40) to modify the output signal according to the weighting coefficients (which) corresponds to the claimed technical limitations of the Applicant's invention including varying the filter coefficients in dependence on the video level of the current pixel of the signal to be filtered. That is, the Applicant submits that Schweid neither teaches nor suggests about that the quantization procedure during the signal processing of a display device with digitally driven pixels causes noise and "varying of at least one filter coefficient of the filter in dependence on the video level for a current pixel by stronger filtering a lower video level for said pixel while less filtering or not filtering a higher video level for said pixel to reduce noise in the lower video level" as taught in the Applicant's Specification and claimed by at least the Applicant's amended, independent claims 13 and 20.

That is, Schweid neither discloses nor suggests to reduce noise in a signal for a display device with digitally driven pixels by stronger filtering a lower video level for said pixel while less or not filtering a higher video level for said pixel as taught and claimed by the Applicant.

In contrast to the invention of the Applicant, Schweid discloses "an image classification system which provides a truer classification of the image type" (See Schweid, col. 4, lines 64 – 66). In Col. 1, lines 27-33, Schweid teaches that "it should be understood that the image content of the original document may consist entirely of multiple **image types, including high frequency halftones, low frequency halftones, continuous tones (contones), line copy, error diffused images,** etc. or a combination of any of the above, and some unknown degree of some or all of the above or additional image types." (emphasis added).

In Col. 1,lines 39-45, Schweid teaches "Thus, for example, where one optimizes the system for low frequency halftones, it often at the expense of degraded rendering of high frequency halftones, or of line copy, and visa versa. To address this particular situation, 'prior art' devices have utilized **automatic image segmentation to serve as a tool to identify different image types or imagery.**" (emphasis added). At Col. 4, lines 55-59 Schweid teaches "Such an approach presents problems in that the classification of the image data is mutually exclusive, the image data is classified as a particular type in absolute terms even though the probability of the decision being correct is just over 50%", thus the Applicant submits that Schweid therefore recommends "to implement a image processing system which takes advantage of the fuzzy classification system" as recited in Schweid on Col 5, lines 4 -6.

In the Office Action, the Examiner relies on a conventional image processing system, as illustrated in FIG. 1 of Schweid, (which) includes image processing module 20 which generally receives offset and gain corrected video through input line 22. Subsequently, the image processing module 20 processes the input video data according to control signals from CPU 24 to produce the output video signals on line 26. As illustrated in FIG. 1, the image processing module 20 may include an optional segmentation block 30 which has an associated line buffer 32, two-dimensional filters 34, and an optional one dimensional effects block 36. (See Schweid Col. 5, lines 58 – 67).

The Examiner alleges that **"2-D filter 34 ... corresponds to the claimed digital filter, the CPU 24 (corresponding to the claimed controller)"**. The Applicant respectfully disagrees. That is, the Applicant submits that the controller according to the present invention includes "a controlling means connected to said digital filter means **for varying at least one of said filter coefficients in dependence on the**

video level for a current pixel by stronger filtering a lower video level for said pixel while less or not filtering a higher video level for said pixel to reduce noise in lower video level". In contrast, Schweid teaches at Col. 6, lines 16-18 that a "Two-dimensional filter block 34 is intended to process the incoming, corrected video in accordance with the predetermined filtering selection" and at Col. 6, lines 46-52 that "Each filter processes a predetermined number of input scanlines at a time pixel by pixel, to calculate each output scanline. As previously described with respect to FIG. 1, input scanlines are buffered in line buffer 38 to meet the filter input requirements. In addition, if the two-dimensional filter 34 is used with segmentation block 30 of FIG. 1, the filter must operate one scanline later than the segmentation block."

The Applicant submits that in accordance with the teachings of Schweid as presented above that Schweid discloses a classification system, wherein control means (CPU 24) control a line based video signal segmentation, wherein the segmentation is based on different image types. More specifically, at Col. 2, lines 22-31, Schweid teaches that "The decision as to what class of imagery a block of image data belongs to is typically binary in nature. For example, in a conventional image segmentation scheme image property classifying section 20 classifies each pixel as one of three classes of imagery, (high frequency halftone, low frequency halftone, or contone). Depending on those classification, each pixel is processed according to the properties of that class of imagery, (either low pass filter and re-screening if it's a high frequency halftone, threshold with a random threshold if it is a low frequency halftone, etc.)" and at Col. 2, lines 33-36 that "...the resulting image classification decision of the peak count image property is made by thresholding the peak count into three classes of imagery as shown in FIG. 16." The Applicant submits that such teachings of Schweid indicate that Schweid, in contrast to the invention of the Applicant, classifies each pixel according to the frequency in the image and neither discloses nor gives a hint to a filter and a controller, which vary filter coefficients of the filter in dependence on the video level for a current pixel as taught in the Applicant's Specification and claimed by at least the Applicant's amended, independent claims 13 and 20.

The Examiner in the Office Action further alleges that, "Fig. 4 illustrates an image processing apparatus utilizing the 2-D filter of Fig.1 and weighting coefficients and gain generator factors 302 used by the 2-D filter (col. 24, 37-40) to modify the output signal according to the weighting coefficients (which corresponds to the claimed varying the

filter coefficients in dependence on the video level of the current pixel of the signal to be filtered)."

That Applicant submits that Schweid in FIG. 4 illustrates the relationship of a non-separable two-dimensional filter in an image processing scheme. As illustrated in FIG. 4, video data is fed in parallel to a segmentation circuit 300 and buffers 306. The segmentation circuit 300 may either be a conventional image segmentation circuit or the fuzzy segmentation circuit discussed above. (See Schweid, col. 24, ll.29- 34). That is, Schweid specifically recites that "A weighting circuit is operatively connected to the one-dimensional second dimension filters to modify each of the produced second filtered output signals according to weighting coefficients." (See Schweid, Abstract). At Col. 7, line 64 through Col. 8, line 5 Schweid discloses "a method for implementing non-separable filtering by filtering digital signals with a plurality of separable filter to produce a plurality of filtered signals, weighting the plurality of filtered signals based on a set of weighting coefficients to produce a plurality of weighted signals, and combining the plurality of weighted signals to produce a single filtered signal.".

Furthermore, at Col. 24, lines 37-40, Schweid recites "This image type or class information is fed into a weighting coefficients and gain factor generator 302 which generates the weighting coefficients and gain factors to be utilized by the non-separable two dimensional filter 304." The Applicant submits that such teachings of Schweid indicate that, in contrast to the invention of the Applicant, Schweid teaches that the image type or class information (the frequency information of the pixel in the image) is fed into a weighting coefficients and gain factor generator which generates the weighting coefficients and gain factors to be utilized by the non-separable two dimensional filters.

The Examiner, in the Office Action further alleges that "The filter may be a low pass filter (col. 22, line 7-8 and 39-40) depending on the noise to be filtered or processed." However, Schweid at Col. 22, lines 7-8 recites "If (pixel is "high frequency halftone"), then filter is LOWPASS." Schweid at Col. 22, lines 39-40 further recites "It is noted that the enhancement filter amplifies all higher frequencies, and the lowpass filter attenuates the higher frequencies." As such, the Applicant submits that Schweid teaches that a lowpass filter is utilized if a pixel is a high frequency halftone pixel and that lowpass filter attenuates higher frequencies.

However, the Applicant submits that Schweid neither discloses nor suggests a filter and a controller, which vary filter coefficients of the filter in dependence on the video level for a current pixel and stronger filtering a lower video level for said pixel while less or not filtering a higher video level for said pixel to reduce noise in lower video level for reducing noise caused by a quantization procedure during the signal processing of a display device with digitally driven pixels as taught in the Applicant's Specification and claims in at least the Applicant's independent claims 13 and 20.

That is, contrary to Examiner's opinion, the Applicant submits that the teachings of "utilizing the 2-D filter of Fig.1 and weighting coefficients and gain generator factors 302 used by the 2-D filter (col. 24, 37-40) to modify the output signal according to the weighting coefficients" does not teach or suggest "varying the filter coefficients in dependence on the video level of the current pixel of the signal to be filtered" as taught and claimed by the Applicant. Instead, the teachings of Schweid merely teach that a 2D filter is applied to the signal, and not that the values of the coefficients are changed depending on the video level of the current pixel of the signal to be filtered. In fact nowhere in Schweid is disclosed or suggested "varying the filter coefficients accordingly to video level of current pixel." Instead, Schweid teaches determining filter coefficients depending on a fuzzy classification for a block of pixels (See Schweid, Col. 18 lines 57-60) in order to "attenuate switching noise common in crisp decision image segmentation processes" (See Schweid, col. 18, lines 64-65).

Therefore and for at least the reasons recited above, the Applicant submits that Schweid fails to disclose each and every element of the Applicant's claimed invention as claimed in at least the Applicant's independent claims 13 and 20. As such, the Applicant submits that for at least the reasons recited above, the Applicant's independent claims 13 and 20 are not anticipated by the teachings of Schweid, and, as such, fully satisfy the requirements of 35 U.S.C. § 102 and are patentable thereunder.

Furthermore, the Applicant's dependent claims 14-15 and 21-22 depend either directly or indirectly from the Applicant's independent claims 13 and 20, respectively, and recite additional features thereof. As such, the Applicant submits that at least because the Applicant's claims 13 and 20 are not anticipated by the teachings of Schweid, the Applicant further submits that the Applicant's dependent claims 14-15 and 21-22, which depend either directly or indirectly from the Applicant's claims 13 and 20,

are also not anticipated by the teachings of Schweid, and, as such, fully satisfy the requirements of 35 U.S.C. § 102 and are patentable thereunder.

The Applicant reserves the right to establish the patentability of each of the claims individually in subsequent prosecution.

C. 35 U.S.C. § 102

The Examiner rejected the Applicant's claims 13-15 and 20-22 under 35 U.S.C. § 102(e) as being anticipated by Kempf et al. (US Pat. No. 7,375,760, hereinafter "Kempf"). The rejection is respectfully traversed.

Kempf recites in the Abstract that "temporal noise reduction is performed on the still parts of the image, *thus preserving high detail spatial information*," and that a "low-pass filter is used in flat fields to smooth out Gaussian noise and a direction-dependent median filter is used in the presence of impulsive noise or an edge. Therefore, the selected spatial filter is optimized for the particular pixel that is being processed to maintain crisp edges." The Applicant submits that the term "temporal noise reduction already indicates that, in contrast to the invention of the Applicant, the noise reduction in Kempf is based on information derived from previous locations of moving objects. However, the Applicant submits that Kempf neither teaches nor suggests varying filter coefficients in dependence on the video level for a current pixel by stronger filtering a lower video level for said pixel while less filtering or not filtering a higher video level for said pixel to reduce noise in the lower video level as taught in the Applicant's Specification and as claimed in at least the Applicant's independent claims 13 and 20.

More specifically, in support of at least claims 13 and 20, the Applicant in the Specification recites:

> "As already set out above, the main idea is to have a maximum of noise reduction for dark areas where the noise is really disturbing (eye sensitivity stronger, gammatization critical) and where the information in terms of detail is less relevant. On the other hand, the level of the filtering will decrease together with the luminance up to no filtering for high luminance levels where the noise is less disturbing (no effect of quantization, less eye sensitivity) but where the information in terms of details will be the more relevant." (See Specification, page 11, lines 25 – 31).

In contrast to the invention of the Applicant, Kempf recites at Col. 1, lines 9-11 that the invention of Kempf "relates to scan rate conversion and particularly to converting interlace video to progressive video based on the data content" and at Col. 1, lines 19-22 with respect to display devices with digitally driven pixels, that "These devices require scan-rate conversion of their interlaced video signals in order to double the vertical resolution of each image field". Even further at Col. 1, lines 33-37, Kempf recites that "To produce the sharpest image, these scan rate converters need to be content dependent. In other words, the scan rate converter must analyze the motion patterns of an interlaced image sequence and determine the most suitable method for scan rate conversion, on a pixel-by-pixel basis" and at Col. 1, lines 53-55 that "A moving object is not in the same spatial location in 2 adjacent fields" and at Col. 1, line 58 to col. 2, line 7 that "In order to minimize the loss of vertical detail in moving objects, the scan rate converter must perform interpolation along edges. In addition, noise on the video must be considered in the scan conversion process since it can give a false indication of motion and can also blur the high spatial detail of the image. In general, in conventional de-interlacing techniques, the vertical resolution of the new progressive image is accomplished by jamming the odd and even field lines, but only when there is no motion. When there is motion, then only the current field is used and the lines above and below the current pixel are averaged. What is needed is a highly integrated scan rate converter that determines, on a pixel-by-pixel basis, if motion is present in the image and then determines the best value for each pixel for a high resolution progressive image."

Kempf further teaches that "In the presence of motion, pixels are interpolated using only the current field" (See Col. 2, lines 39 – 40). Kempf further teaches that "In the absence of motion, the present field is jammed with the previous field. To prevent false motion detection, the scan rate converter uses a temporal maximum motion filter. Since simple, frame-based motion detection fails when moving objects change direction or move quickly, a temporal maximum motion filter is used to provide a memory of previous locations of moving objects. This scan rate converter is highly noise robust with the motion values being filtered for the two most common video noise distributions, impulsive noise and Gaussian noise. The video data is also passed through an adaptive noise reduction filter. This adaptive video noise reduction is incorporated in the process so that temporal noise reduction is performed on the still parts of the image,

thus preserving high detail spatial information and data adaptive spatial noise reduction is performed on the moving parts of the image. A low-pass filter is used in flat fields to smooth out Gaussian noise, and a direction-dependent median filter is used in the presence of impulsive noise or an edge. Therefore, the selected spatial filter is optimized for the particular pixel that is being processed to maintain crisp edges." (See, Kempf, Col. 2,lines 42 – 62).

Even further, Kempf teaches that "The motion and edge information used by the scan rate converter is also used in the video noise reduction function. In the absence of motion, temporal redundancy can be exploited, and a temporal filter can be used for noise mitigation. When motion is detected, there is no temporal correlation, so a spatial filter must be used for noise mitigation. Edge information determines the best suited spatial filter. A median filter should be used in the presence of an edge, and a low-pass filter should be used in flat fields." (See, Kempf, Col. 4, lines 52 – 61). The Applicant submits that as indicated at least by the portions of Kempf presented above, that Kempf teaches to utilize temporal redundancy in the absence of motion, to use a spatial filter when motion is detected and to employ a low-pass filter in flat fields if an edge is not present.

The Applicant submits that the teachings of Kempf are in contrast to the teachings and claims of the Applicant which include "varying the filter coefficients in dependence on the video level of the current pixel of the signal to be filtered" as taught and claimed by the Applicant.

The Examiner alleges in the Office Action that in Kempf "The selected spatial filter is optimized for the particular pixel that is being processed to maintain crisp edges. (See, Abstract; col. 6, lines 52-59, col. 10, lines 4-20; emphasis added). However, the Applicant submits that Kempf specifically teaches a median filter 205 for impulsive noise reduction and low-pass filter 206 for Gaussian noise removal. In Kemp, the filter taps have binary coefficients to simplify the implementation to logic circuitry (which corresponds to the claimed controlling means) shifts and adds (See, Kempf, col. 9, lines 39-52)."

First of all, it should be noted that, in contrast to the teachings and claims of the Applicant's invention directed to a dependency on the video level for a current pixel, Kempf discloses a dependency based on information derived from previous locations of moving objects and neither from a current pixel nor from the video level for a current

pixel as "data-adaptive spatial noise reduction is performed on the moving parts of the image" and "A low-pass filter is used in flat fields to smooth out Gaussian noise and a direction-dependent median filter is used in the presence of impulsive noise or an edge. Therefore, the selected spatial filter is optimized for the particular pixel that is being processed to maintain crisp edges." (See Kempf, Abstract). The Applicant submits that such teachings of Kempf make it clear that, in contrast to the invention of the Applicant, in Kempf the spatial filter is selected for and not dependent on the particular pixel that is being processed.

Kempf discloses at Col. 6, lines 52-59: "The orientation of an edge is determined by observing the results of several luminance subtractions. The edge detection circuit 222 takes the difference between pixels in a 3x3 matrix, and if all of these differences lie below a certain pre-defined threshold, then it is assumed that an edge is not present, and a two-dimensional low-pass filter will be used. However, if an edge is detected, a direction dependent 5-tap median filter will be used." The Applicant submits that such teaching of Kempf make it clear that in contrast to the invention of the Applicant, Kempf teaches to detect edges by evaluation differences between pixels in a 3x3 matrix and if an edge is not present to use a two-dimensional low-pass filter.

Furthermore, Kempf, at Col. 10, lines 4-20, recites: "The absolute difference between a raw frame difference and its filtered result is equal to the amount of motion noise for a given pixel. The range of the 9-bit raw frame difference is reduced to 8-bits by removing the LSB with divider 1000. The 8-bit filtered motion results are then subtracted with adder 1001. The absolute value 1002 of this result is taken to obtain the magnitude of the difference between the two signals. Finally, the noise floor for an entire field is determined by summing all of these difference magnitudes over the entire field with summing function 1003. This noise detection parameter is used to determine noise reduction parameters for the actual video data. In other words, if the noise detection parameter is high, then the video data will be strongly filtered by the noise reduction circuitry. Conversely, if the noise detection parameter is low, then little to no noise reduction will be performed on the video stream." The Applicant submits that such teaching of Kempf make it clear that in contrast to the invention of the Applicant, Kempf teaches to detect motion noise and if the motion noise detection parameter is high, then the video data will be strongly filtered by the noise reduction circuitry.

As such, the Applicant submits that Kempf neither teaches nor suggests to vary filter coefficients in dependence on the video level for a current pixel by stronger filtering a lower video level for said pixel while less filtering or not filtering a higher video level for the pixel to reduce noise in the lower video level as taught in the Applicant's Specification and claimed by at least the Applicant's claims 13 and 20.

The Examiner further cited col. 9, lines 39-52 of Kempf for attempting to anticipate the Applicant's claimed controlling means. However, Kempf teaches: "To reduce impulsive noise, the motion image is then passed through a 5-tap median filter 205, as described in FIG. 8. The dark gray area 800 shows the span of the filter, which consists of the current pixel (x,y) 801, adjacent horizontal pixels in the current line (x+1,y) 803 and (x-1,y) 805, and adjacent pixels in the previous and next lines (x,y-1) 802 and (x,y+1) 804. In parallel with the median filter is a 3-pixel by 3-line (3x3) low-pass filter 206, shown in FIG. 9 that is used to remove Gaussian noise. The filter taps have binary coefficients to simplify the implementation to logic circuitry shifts and adds. The coefficients are as follows: current pixel 900→1/4, adjacent horizontal pixels 906, 908→1/8, adjacent vertical pixels 905, 907→1/8, corner pixels 901-903→1/16."
The Applicant submits that "impulsive noise" is defined as impulses having noise level that fluctuates over a range greater than 10 dB during observation. (see e.g. http://www.diracdelta.co.uk/science/source/i/m/impulsive%20noise/source.html)

Kempf at col. 9, lines 52 – 56 recites: "In determining the median filter 205 results, the difference between the center tap value (x,y) and the non-center tap values ((x-1,y), (x+1,y), (x,y+1), (x,y-l1) must be calculated." It indicates in addition to the above description of the median filter 205 that Kempf filtering is based on the values of neighboring pixel and in difference to the present invention is not based on the value of the current pixel. Furthermore Kempf at col. 9, lines 61 – 67 recites: "The low-pass filter is more effective on Gaussian noise. Therefore, when one or more differences lie above a pre-defined threshold, indicating the presence of a motion edge or impulsive noise, the results of the median filter are used. Conversely, when all the differences lie below the pre-defined threshold, the results of the low-pass filter are used." Finally at Col. 9, lines 55-59, Kempf recites that "The absolute value of these differences is used to determine which noise reduction filter is more suitable to be selected by the multiplexer 207, the median filter 205 or the low-pass filter 206, for the current pixel (x,y)."

The Applicant submits that such teachings of Kempf make it clear that in Kempf, a control means utilizes a low-pass filter dependent on whether or not edges being detected. However, the Applicant submits that there is absolutely no teaching or suggestion in Kempf for varying at least one of said filter coefficients of the filter in dependence on the video level for a current pixel by stronger filtering a lower video level for said pixel while less filtering or not filtering a higher video level for said pixel to reduce noise in the lower video level as taught in the Applicant's Specification and as claimed by at least the Applicant's claims 13 and 20.

In contrast to the invention of the Applicant, Kempf's "content-dependent video noise reduction" discloses switching from spatial filtering to temporal filtering depending on pixel differences. But Kemps fails to disclose "varying the filter coefficients in dependence on the video level of the current pixel of the signal to be filtered" (in Kempf, the filter coefficients do not vary and nothing is directly dependent on the video level).

Therefore and for at least the reasons recited above, the Applicant submits that Kempf fails to disclose each and every element of the Applicant's claimed invention as claimed in at least the Applicant's independent claims 13 and 20. As such, the Applicant submits that for at least the reasons recited above, the Applicant's independent claims 13 and 20 are not anticipated by the teachings of Kempf, and, as such, fully satisfy the requirements of 35 U.S.C. § 102 and are patentable thereunder.

Furthermore, the Applicant's dependent claims 14-15 and 21-22 depend either directly or indirectly from the Applicant's independent claims 13 and 20, respectively, and recite additional features thereof. As such, the Applicant submits that at least because the Applicant's claims 13 and 20 are not anticipated by the teachings of Kempf, the Applicant further submits that the Applicant's dependent claims 14-15 and 21-22, which depend either directly or indirectly from the Applicant's claims 13 and 20, are also not anticipated by the teachings of Kempf, and, as such, fully satisfy the requirements of 35 U.S.C. § 102 and are patentable thereunder.

The Applicant reserves the right to establish the patentability of each of the claims individually in subsequent prosecution.

Conclusion

Thus, the Applicant submits that none of the claims, presently in the application, are anticipated under the provisions of 35 U.S.C. § 102. Consequently, the Applicant

believes that all these claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If however, the Examiner believes that there are any unresolved issues requiring adverse final action in any of the claims now pending in the application, or if the Examiner believes a telephone interview would expedite the prosecution of the subject application to completion, it is respectfully requested that the Examiner telephone the undersigned.

No fee is believed due. However, if a fee is due, please charge the additional fee to Deposit Account No. 07-0832.

Respectfully submitted,
Sebastian Weitbruch

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